ERGONOMICS RECOMMENDATIONS FOR CONSTRUCTION WORKERS

Presented by: M3 Insurance

Source: National Institute of Occupational Safety and Health (NIOSH)

Injury Statistics

- Though construction accounts for only eight percent of U.S. workers, it represents 17 percent of all workplace fatalities.
- Backaches and pain in the shoulders, neck, arms and hands are the most common symptoms reported by construction workers.
- The number one cause of work-related injuries resulting in work absence was contact with objects, such as tools and equipment
  - This can cause soreness, pain, and various types of injuries, including musculoskeletal
    - Musculoskeletal injuries can cause temporary or even permanent disability, which can affect workers' earnings and contractors' profits.

What is Ergonomics?

Goals:

- To find the "best fit" between the worker and job conditions present
- To create solutions to ensure that workers stay safe, comfortable and productive

Method:

- By modifying tools, equipment, materials, work methods or the workplace itself

Ergonomics analyzes physical abilities and limitations of the human body as they relate to:

- Work tasks
- Tools, equipment and materials
- Job environment

Work-Related Musculoskeletal Disorders

Work-related musculoskeletal disorders (WMSDs) are caused by:

- Working in awkward positions
- Bending
- Using vibrating equipment
- Kneeling
- Applying force
- Working overhead
- Gripping

Establishing an Ergonomics Program

Ergonomics program may be especially necessary if:

- Injury records or workers' compensation claims show excessive hand, arm and shoulder problems or lower back pain
- Workers complain that tasks are causing aches, pains and soreness (symptoms that do not go away after a night of rest)
- Jobs on the site require forceful actions, repeated movements, heavy lifting, vibrating equipment or awkward positions
- Similar businesses in the same field have high rates of WMDSs
- Trade magazines and insurance publications discuss these disorders for your industry

Establishing an Ergonomics Program

An ergonomics program should include the following:

- Employer commitment of time, personnel and resources
- Someone in charge of the program who is authorized to make decisions and institute changes
- Active employee involvement in identifying problems and finding solutions
- Clearly defined administrative structure (committee)
- System for identifying and analyzing risk factors
- System in place to research, obtain and implement solutions for new equipment
- Worker and management training
- Medical care for injured workers
- Good injury record maintenance
- Regular evaluations of the program's effectiveness

Floor- and Ground-Level Work

Injuries and Disorders:

- Lower back pain
  - While bending forward, muscles must work harder so the discs in your back get squeezed and your ligaments flex and stretch. As discs squeeze, they can press on nerves in the spine and cause pain.
  - Bending forward excessively over a long period of time causes discs to weaken and eventually rupture (herniated disc).
  - Excessive twisting puts stress on cartilage and ligaments.
- Knee inflammation and pain
  - Continual stress from kneeling can cause knee tendons to become inflamed.

Floor- and Ground-Level Work

Solutions:

- Change materials or work processes
  - Use materials, building components or work methods that are less labor-intensive, so the tasks take less time and workers kneel and stoop for a shorter period of time.
  - Raise the work to waist height rather than kneeling.
- Change tools and/or equipment
  - Use tools with extension handles that allow workers to stand up while doing floor-level tasks rather than kneeling.

Floor- and Ground-Level Work

Fastening Tools:

- Use an auto-feed screw gun with an extension to stand upright while working
  - Keeps the spine and knees neutral to minimizes strain and muscle fatigue.
  - Loads without requiring workers to bend down.
- Use a powder-actuated fastening tool with a stand-up handle

Auto-feed Stand-up Screw Gun

Floor- and Ground-Level Work

Motorized Screeding

Motorized Concrete Screed (also known as a vibratory screed):

- Allows workers to stand upright and operate the screed takes less effort than doing it by hand
- Eliminates both the screeding in a stooped position and the need for repeated arm and shoulder movements

Floor- and Ground-Level Work

Rebar-tying Tools:

- Lower the risk of hand and wrist injury because they eliminate the frequent rapid hand motions required while using pliers
- Some models allow workers to stand, so there is less stress on the lower back due to stooping and bending

Rebar-tying Tool with Extension Handle

Floor- and Ground-Level Work

Kneeling Creepers:

- Use a portable kneeling creeper with chest support
  - Reduces stress on the knees, ankles and lower back
  - Knee supports are extremely close to the floor
  - Cushioned supports reduce pressure similar to knee pads

Laying Tile with a Kneeling Creeper

Floor- and Ground-Level Work

Adjustable Scaffolding for Masonry Work:

- Use split-level adjustable scaffolding when laying bricks and blocks
  - Workers do not have to stoop as often because the materials and the work surface are both kept near waist height.

Masons Finish Top Course on Split-Level Adjustable Scaffolding

Overhead Work

Injuries and Disorders:

- Shoulder pain and inflammation
  - Continual stress on the shoulders can cause the bursa (small sacs of fluid between the tendons and bones) to get squeezed, swollen, stiff and inflamed (bursitis).
  - Continual stress on the shoulder can also cause tendons to become inflamed and result in pain (tendonitis).
  - Stress on the shoulder may cause rotator cuff muscles to tear, which can make everyday activities extremely difficult.
- Neck strain
  - Keeping the neck bent forward or backward makes the muscles work harder and causes the ligaments to stretch and flex. This can cause tearing and spraining.
  - Tension neck syndrome can occur after long periods of looking up.

Overhead Work

Solutions:

- Change materials or work processes
  - Use materials, building components or work methods that are less labor-intensive, so that tasks take less time and workers reach overhead for a shorter period of time.
- Change tools and/or equipment
  - Use bit extensions for drills and screw guns that allow workers to hold the tool at waist or shoulder level rather than above their heads.
  - Use mechanical lifts or hoists to raise and position building materials rather than lifting them manually.
  - Workers should use a lift so that they are closer to the work.

Overhead Work

Bit Extension Shafts for Drills and Screw Guns:

- A bit extension shaft for the drill or screw gun allows the worker to hold the tool below the shoulder and closer to the waist
  - Hold upper arms close to and in front of the body.
  - Use biceps instead of shoulder muscles.

Worker Using Extension

Overhead Work

PAT with Modular Extension

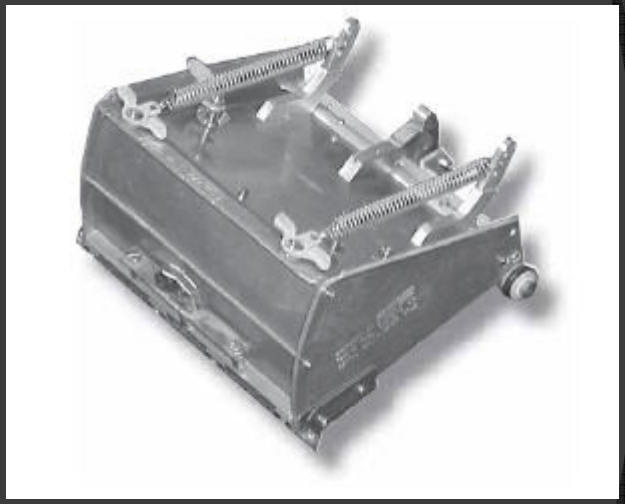
Extension Poles for Powder-Actuated Tools (PATs):

- Attaches to powder-actuated tools and removes them entirely from the hand. Workers simply have to pull the trigger.
- Keep arms close to the body and below the shoulders.
- Extension pole also allows workers to work from the ground rather than from a ladder or scaffold.

Overhead Work

Spring-Assisted Drywall Finishing Tools:

- Springs provide 75 percent of the force needed to push the compound onto the wall when using spring-assisted flat boxes.
- Spring-assisted corner tools provide 100 percent of the forced needed to finish corners.



Spring-Assisted Mudbox

Overhead Work

Pneumatic Drywall Finishing Tools:

- Use a pneumatic drywall finishing system to avoid hand finishing without the use of flat and corner boxes.
- Using this tool with an air compressor provides enough pressure to force the drywall compound through the flat and corner-finishing heads of the pneumatic system.

Pneumatic Finishing System

Lifting, Holding and Handling Materials

Injuries and Disorders:

- Lower back pain or more serious musculoskeletal injuries to the back
  - Sudden quick movements, especially while handling heavy objects, leads to muscle strains.
  - Excessive bending forward weakens the discs in the spine and can lead to a disc rupture (herniated disc) .
- Shoulder and neck strain
  - Continual stress on the shoulders can cause a bursa to get squeezed and inflamed (bursitis).
  - Tension neck syndrome
- Arms, hands and wrist stresses/punctures
  - Heavy loads with sharp edges can cause punctures and carrying heavy or awkward objects can lead to tendonitis or carpal tunnel syndrome.

Lifting, Holding and Handling Materials

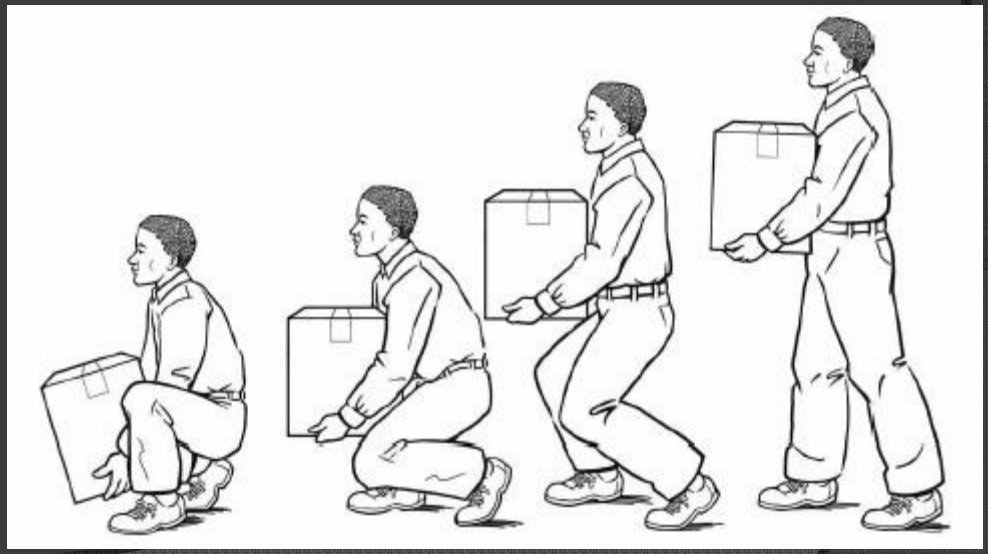
Solutions:

- Change materials or work processes
  - Use materials, building components or work methods that are less labor-intensive.
  - Use alternative materials that can be handled without requiring a lot of physical strength, awkward posturing or repetitive motions.
- Change tools and/or equipment
  - Use special round handles and cushioned grips for carrying heavy objects.
  - Use powered and non-powered carts and dollies for indoor and outdoor use; rolling carts for sheet materials, pipes or conduit; and stands or jacks to hold materials during installation.

Lifting, Holding and Handling Materials

NIOSH Lifting Guidelines:

- One person should not lift more than 51 pounds.
- Don't reach more than 10 inches away from the body when lifting.
- Avoid twisting the body.
- Lift with the legs, not the back.
- Use a two-handed grip.

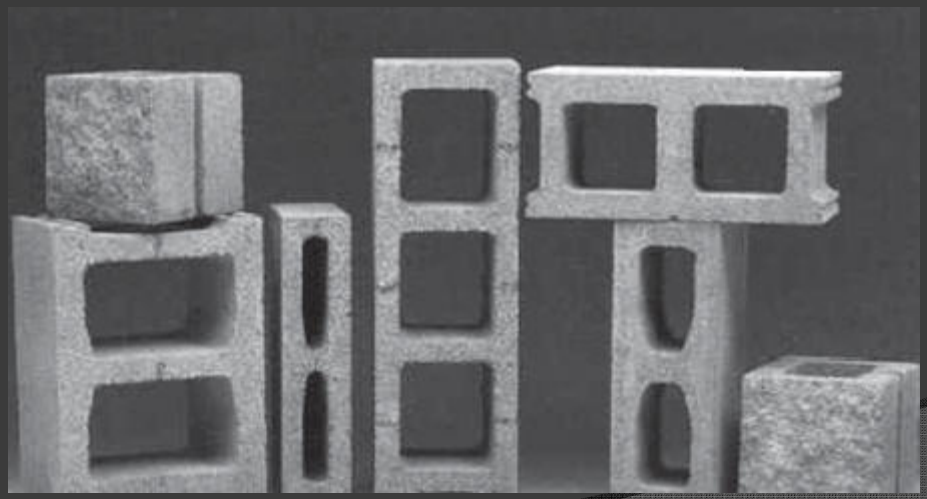


Proper lifting technique

Lifting, Holding and Handling Materials

Lightweight Concrete Blocks:

- You can use lightweight concrete blocks weighing 30 to 40 percent less than regular blocks, without sacrificing strength or performance
- By carrying less weight, there is less stress on the muscles in the arms and back.



Lifting, Holding and Handling Materials

Pre-Blended Mortar and Grout Bulk Delivery Systems:

- This product can be delivered to a jobsite and alleviates the need to lift and carry sand.
- All dry ingredients are handled mechanically with a forklift or boom truck.

Loading a Silo System

Lifting, Holding and Handling Materials

Skid Plates to Move Concrete-Filled Hoses:

- Use skid plates (hose placing discs) when concrete boom pumps are not available
- Skid plates are two-foot diameter concave metal discs that are placed under the hose couplings.
- Decreases the friction with the rebar matting underneath and make the hose easier to pull.

Pulling Hose with Skid Plate and Hook

Lifting, Holding and Handling Materials

Using Powered Vacuum Lift

Vacuum Lifters:

- Use vacuum lifters for window and flat panel installation
- Eliminates the need to manually lift and position awkward materials.

Hand-Intensive Labor

Injuries and Disorders:

- Tendonitis in the hands, fingers, wrists and forearms
  - Occurs when frequently exerting force with the hands, bending at the wrist or repeating the same wrist movements over and over.
- Carpal tunnel syndrome leading to pain, tingling and numbness
- Trigger finger
  - Tendons are strained from repeated pressure on a finger. This causes discomfort and pain.
- Epicondylitis (tennis elbow)
  - Twisting motions cause strain on elbow tendons, causing discomfort and pain.
- Hand-arm vibrating syndrome (HAVS)
  - Occurs when using vibrating tools like needle guns, chipping hammers and rotary hammer drills. Leads to finger discoloration, tingling and numbness.

Hand-Intensive Labor

Solutions:

- Change materials or work processes
  - Use materials, building components or work methods that are less labor-intensive.
  - Use lock nuts or button nuts on all-thread systems to reduce repeated hand-arm twisting and turning.
- Change tools and/or equipment
  - If work requires frequent intensive hand activity, substitute a power tool for a manual tool, if possible.
  - Use ergonomically improved tools such as ones with a power grip.
  - Use the right tool for the job.

Hand-Intensive Labor

Ergonomic Hand Tools:

- Tools are considered ergonomic when they fit the task, fit the hand, allow for a good grip, take less effort, do not require work in an awkward position, do not dig into the fingers or hands, and are comfortable and effective.
- Tools should keep the wrist straight when using them.
- Handles should be non-slip and coated with a soft material.

Tool with Soft Grip and Spring-Loaded Handle

Tool with Offset Handle

Hand-Intensive Labor

Easy-Hold Gloves:

- Use easy-hold gloves for mud pans
- Gloves cut down on the hand strength required to grip the pan.

Holding Mud Pan with Gloves

Glove Assembly

Hand-Intensive Labor

Power Caulking Guns:

- Use a power caulking gun for easy caulk installation
- Tools are powered by battery or air compressor (pneumatic) and do not require workers to pull the trigger to apply the caulk or sealant
- Reduces the stress on the body

Caulking Adapter for a Drill

Hand-Intensive Tools

Air Bladder Gloves, a Form of Anti-Vibration Gloves

Reduced Vibration Power Tools:

- Use reduced vibration power tools to reduce stress
- Use tools with full-fingered anti-vibration gloves that are certified to meet the International Organization for Standardization (ISO) vibration standards (ISO 10819).

Hand-Intensive Labor

Power Cleaning and Reaming with a Brush:

- Place a wire brush in the chuck of a battery-powered or corded screw gun or screwdriver
- Using a power tool eliminates the repeated hand, wrist and forearm motions and improves grip.

Wire Brush with a Power Driver

Hand-Intensive Labor

Snips:

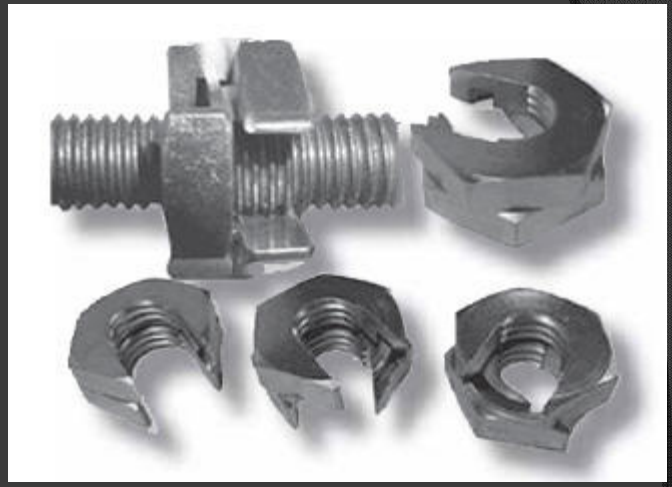
- Use snips to cut sheet metal
- Always use the correct size and type of snip for the job.
- Look for models that keep wrists straight and require less hand force.

Tapping Into Duct Using an Upright Snip

Hand-Intensive Labor

Quick-Threading Lock Nuts:

- Depending on the type of nut, they either snap onto an all-thread rod or slide up and down the rod freely.
- Reduces the time that workers spend working above the shoulders and eliminates hand, wrist, forearm and elbow twisting.



Two Piece Slip-On Lock Nut (top) and Button Lock Nut (Bottom)

Our Ergonomics Solutions

PLAYING IT SAFE

Be safe and healthy on the job at [C_Officialname] with these helpful tips provided by [B_Officialname].

Reduce Your Risk of Back Injuries

Helpful tips for lifting properly at the site

Construction tasks require constantly working around heavy objects, machinery and many other situations that can cause serious injury. And lower back injuries caused by lifting heavy objects are one of the most common work-related injuries in the construction industry. Follow these simple guidelines to ensure that you're lifting properly.

Proper Lifting Techniques

- Wear gloves if you are lifting rough equipment.
- Clear away any potential obstacles before beginning to carry an object.
- Get a good grip and good footing. Use your hands, not your fingers, to grip the load, and position your feet so that one foot is next to the load and one is behind it.
- Get under the load by bending your knees, not your back. This is the most important lifting technique to remember, as bending over at the waist to reach for the object puts strain on your back, shoulder and neck muscles, and can cause serious injury.
- Keep the load close to your body.
- Never twist your body when you are lifting. Turn your entire body by using your feet.
- Do not lift above the shoulders or below waist level.

Size up the Load

Before lifting an object, check its weight. Decide if you can handle it alone or if you need assistance. When in doubt, ask for help. Moving an object that is too heavy or bulky can cause severe injury. As a general rule, most men should not lift more than 37 pounds, and most women should not lift more than 26 pounds. If a particular load is heavier than you can handle:

- Get someone to help.
- Break it down into smaller loads if possible.
- Use lifts or other equipment as aids. These tools were made for heavy lifting.

Lifting as a Team

When others are helping you lift, teamwork is very important. If you're going to be carrying the load to another point, both of you should coordinate this prior to lifting the object. Check the route and clearance. One worker needs to be in a position to observe and direct the other. Lifting and lowering should be done in unison. Don't let the load drop suddenly without warning your partner.

Get Fit!

People who are in poor physical condition are at greater risk for back problems. A conditioning program that includes aerobics, weight training and stretching exercises will help you prepare your body for the rigors of lifting. If lifting is a regular part of your job, you may also want to consider wearing a back belt for added support.

CONSTRUCTION AND CONTRACTING

Safety education for [C_Officialname] provided by the insurance specialists at [B_Officialname]

TARGET ON SAFETY

The Basics of Ergonomics

Introduction

Working through pain can be a serious problem in construction. If you continue to work when you're hurt, you are risking disabling injuries that could end your career. When you study the way you perform tasks on site, you can identify problems as them before getting hurt. This study is called ergonomics.

Results of Musculoskeletal Disorders

Musculoskeletal disorders can develop either suddenly or over time, causing dei and wages at work. The most common pains come from strains in the neck, low and eyes due to one or more of four primary risk factors: awkward postures, exc stress. **The way employees lift and move their bodies is a major contributi**

About Your Work Site

The way your work site is set up may determine your risk of developing a Improper positioning on site can cause various disorders by causing you to reac regularly bending or twisting to do regular tasks, your risk of developing a disord several basic guidelines, you can stay pain- and injury-free.

Warming Up Before Work

Moving the body in ways it is not ready to move and using muscle groups that h major cause of pain. **There is real value in practicing basic stretching exerci neck to prepare our bodies for work.** Begin with your hands and wrists, stretc typically made at work. Stretch your neck gently from side to side and then from sitting in a chair by bending your chin toward your knees.

Lifting Methods

When lifting, first take a good look at the load. If it is too awkward, too big or too workers lift items that are too big for them simply because they are unwilling to a and lost wages. **Success at your job means getting assistance when neces**

Second, **lift with your legs, never with your back**. Your legs are your biggest they are able to lift heavier objects. With a straight back, keep weights at should are lifting heavy objects can strain your back muscles, which can lead to pain ar

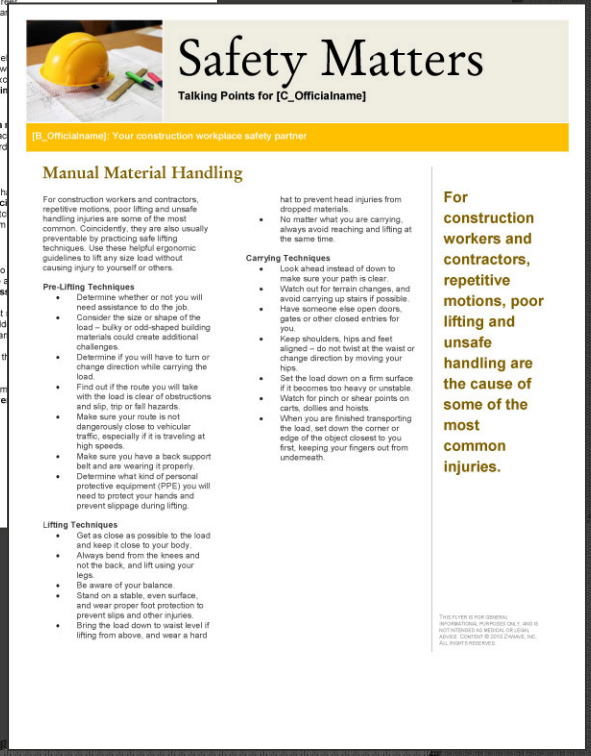
Third, **avoid lifting and twisting in the same motion**. Your first goal is to get t are straight, you can move your legs instead of twisting your back.

One final thought on lifting: back belts do not allow you to lift more weight and m cause you to ignore proper lifting principles. **The only way to effectively preve**

WHAT DO YOU KNOW ABOUT SAF

Ready to test your back safety skills? Answer the follo circling "T" for true or "F" for false to determine your

Workplace Injury	T	F	Employees suffer from back
	T	F	Back pain is the top reason
	T	F	The leading cause of disab
	T	F	Back injuries don't cost as r
Personal Risk	T	F	There are warning signs for
	T	F	Pain is good for you - it buil
	T	F	If you haven't had problems
	T	F	Back pain is an inevitable p
	T	F	Back pain is common – it d
	T	F	Increasing pain is a sign tha
	T	F	Men should not lift more tha
	T	F	Women should not lift more
Ergonomics	T	F	Always carry loads close to
	T	F	Use the same techniques t
	T	F	Reaching outward relieves
	T	F	Always lift with your legs.
	T	F	How I work at home can also affect my back.
	T	F	It's better to lift a heavy object by yourself than to ask for help.
	T	F	It's best to bend at the waist when lifting.
	T	F	Squatting to pick up items is bad for your back.
	T	F	There is no right way to lift.
	T	F	It's best to turn at the waist instead of twisting the entire body.
Back Belts	T	F	Back belts can cause muscle weakness if worn too tight.
	T	F	Back belts provide support to the back.
	T	F	Back belts make you stronger.
	T	F	People in good shape are at a lesser risk for back problems.



Safety Matters

Talking Points for [C_Officialname]

[B_Officialname]: Your construction workplace safety partner

Manual Material Handling

For construction workers and contractors, repetitive motions, poor lifting and unsafe handling injuries are some of the most common. Coincidently, they are also usually preventable by practicing safe lifting techniques. Use these helpful ergonomic guidelines to lift any size load without causing injury to yourself or others.

Pre-Lifting Techniques

- Determine whether or not you will need assistance to do the job.
- Consider the size or shape of the load – bulky or odd-shaped building materials could create additional challenges.
- Determine if you will have to turn or change direction while carrying the load.
- Find out if the route you will take with the load is clear of obstructions and slip, trip or fall hazards.
- Make sure your route is not dangerously close to vehicular traffic, especially if it is traveling at high speeds.
- Make sure you have a back support belt and are wearing it properly.
- Determine what kind of personal protective equipment (PPE) you will need to protect your hands and prevent slippage during lifting.

Lifting Techniques

- Get as close as possible to the load and keep it close to your body.
- Always bend from the knees and not the back, and lift using your legs.
- Be aware of your balance.
- Stand on a stable, even surface, and wear proper foot protection to prevent slips and other injuries.
- Bring the load down to waist level if lifting from above, and wear a hard hat to prevent head injuries from dropped materials.
- No matter what you are carrying, always avoid reaching and lifting at the same time.

Carrying Techniques

- Look ahead instead of down to make sure your path is clear.
- Watch out for terrain changes, and avoid carrying up stairs if possible.
- Have someone else open doors, gates or other closed entries for you.
- Keep shoulders, hips and feet aligned – do not twist at the waist or change direction by moving your hips.
- Set the load down on a firm surface if it becomes too heavy or unstable.
- Watch for pinch or shear points on carts, dollies and hoists.
- When you are finished transporting the load, set down the corner or edge of the object closest to you first, keeping your fingers out from underneath.

For construction workers and contractors, repetitive motions, poor lifting and unsafe handling are the cause of some of the most common injuries.

M3 Insurance

and

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Working together to promote worker safety!